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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/086,472	02/28/2002	Tomowaki Takahashi	4641-62398	3196

7590 03/16/2004

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EXAMINER

NGUYEN, THONG Q

ART UNIT	PAPER NUMBER
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2872

DATE MAILED: 03/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/086,472	Applicant(s) TAKAHASHI, TOMOWAKI	
	Examiner Thong Q. Nguyen	Art Unit 2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 November 2003 and 13 January 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 20-55 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 20-55 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>11/14/03</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 1/13/2004 has been entered.

Response to Amendment

2. The present Office action is made in response to the amendment and the Terminal disclaimer filed on 11/14/2003.

Specification

3. The lengthy specification which is amended by the amendment of 11/14/2003 has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 102

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 20 and 25-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Palmer (U.S. Patent No. 4,714,307, of record)

Palmer discloses an optical device comprises a catadioptric system and a refractive system. The catadioptric system comprises a primary mirror (1), a Mangin mirror system (2) and a set of lens elements (3-5) for forming an image (I) of an object. The intermediate image is viewed by a refractive system disposed on the downstream of the catadioptric system wherein the refractive system comprises a plurality of lens elements (6-8). Since the object is imaged into an intermediate image by the catadioptric system; therefore, the object and its intermediate image are conjugated to each other. Regarding to the feature relating to the aspheric surface of one optical element in either the catadioptric system and the refractive system, it is noted that in column 3, lines 44-47, Palmer suggests that the mirror surfaces and lens surfaces can be made as aspheric surfaces. Regarding to the so-called "the predetermined area of the object is displaced from the optical axis" as recited in claim 1, such a feature is readable from the structure of the system provided by Palmer when the system is received or formed an intermediate image of a section of object located/displaced away from the optical axis of the system.

Claim Rejections - 35 USC § 103

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
7. Claims 20, 25-26 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moskovich (U.S. Patent No. 4,971,428) in view of Palmer (U.S. Patent No. 4,714,307) (both of record).

Moskovich discloses an optical device having a catadioptric system and a refractive system. The catadioptric system (G1) comprises a primary concave mirror (M1), a secondary mirror (M2) and a set of lens elements (L1-L8) for forming an intermediate image (I) wherein the lens element (L2) is a diverging lens element (see column 3, Table I). The refractive system (L9-L18) disposed on the downstream of the catadioptric system for forming an image from the intermediate image formed by the catadioptric system. Since the object is imaged into an intermediate image by the catadioptric system; therefore, the object and its intermediate image are conjugated to each other. Regarding to the so-called "the predetermined area of the object is displaced from the optical axis" as recited in claim 1, such a feature is readable from the structure of the system provided by Palmer when the system is received or formed an intermediate image of a section of object located/displaced away from the optical axis of the system. It is noted that Moskovich does not disclose that one of the catadioptric system and refractive system having one aspheric surface for correcting the image aberration. However, the use of at least one aspheric surface in a system having a catadioptric system and a refractive system for correcting the image aberration is known to one skilled in the art. Palmer discloses an optical device comprises a catadioptric system and a refractive system. The catadioptric system comprises at least one mirror and one lens for forming an image of an object, and the refractive system comprises three lens elements for forming an image of the intermediate image to be viewed/observed by a user. In column 3, lines 44-

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47, Palmer suggests that the mirror and lens surfaces can be made as aspheric surfaces. Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the system provided by Moskovich by using at least one aspheric surface for the mirror and lens as suggested by Palmer for the purpose of increasing the ability of image correction.

8. Claims 20-38 and 45-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishiyama et al (U.S. Patent No. 5,694,241, of record) in view of Palmer (U.S. Patent No. 4,714,307, of record).

Ishiyama et al disclose an exposure system for copying/imaging a mask on a reticle to a wafer. See columns 6-7 and fig. 1. The optical system used to imaging the reticle onto the wafer comprises a catadioptric system and a refractive system. In the embodiment described in columns 9-10, Table 3 and fig. 5, the catadioptric system comprises a concave mirror and a set of lens elements for forming an intermediate image of the reticle. The refractive system comprises a set of lens elements and an aperture stop for imaging the intermediate onto the wafer. The use of a reflective surface for reflecting light from the concave mirror to the refractive system, and the use of another reflective element inside the refractive system is also suggested by Ishiyama et al as can be seen in mentioned columns and figure 5 which shown the beam splitter and the mirror (M2). The only feature missing from the system provided by Ishiyama et al is that they do not suggest the use of an aspheric surface for one optical element in either the catadioptric system or refractive system for the purpose of correcting

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the aberrations. However, the use of an optical device having a catadioptric system and a refractive system wherein at least one surface of the optical element has an aspheric surface is clearly suggested to one skilled in the art as can be seen in the system provided by Palmer. In particular, Palmer discloses an optical device comprises a catadioptric system and a refractive system. The catadioptric system comprises at least one mirror and one lens for forming an image of an object, and the refractive system comprises three lens elements for forming an image of the intermediate image to be viewed/observed by a user. In column 3, lines 44-47, Palmer suggest that the mirror and lens surfaces can be made as aspheric surfaces. Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the system provided by Ishiyama et al by using at least one aspheric surface for the mirror and lens as suggested by Palmer for the purpose of increasing the ability of image correction.

9. Claims 39-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishiyama et al in view of Palmer as applied to claims 20 and 38 above, and further in view of Shafer (U.S. Patent No. 4,342,503) and/or Korsch (U.S. Patent No. 4,737,021).

While Palmer suggests the use of aspheric surfaces for optical elements in the catadioptric system and reflective system; however, Palmer does not clearly disclose the position of the aspheric mirror with respect to the optical axis of the system as claimed. However, the use of an aspheric mirror in an optical device wherein the aspheric surface is disposed on optical axis with a symmetric manner or disposed in an off-axis manner with respect to the optical axis is

known to one skilled in the art as can be seen in the optical device provided by Shafer or Korsch. In particular, Shafer discloses an optical device and teaches the use of aspheric mirrors arranged in symmetric manner with respect to the optical axis of the device (see columns 2-3 and fig. 3, for example). The use of aspheric mirror disposed in asymmetric manner with respect to the optical axis is described in column 4 and shown in figure 2 of Korsch. Thus, it would have been obvious to one skilled in the art at the time the invention was made to utilize the teachings provided by Shafer and/or Korsch by arranging the aspheric mirror in a symmetric manner as suggested by Shafer or in an asymmetric manner as suggested by Korsch for the purpose of satisfying a particular design/application.

Conclusion

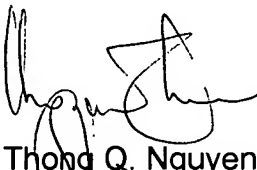
10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thong Q. Nguyen whose telephone number is (571) 272-2316. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew A. Dunn can be reached on (571) 272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Thong Q. Nguyen
Primary Examiner
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